B1 Cont

quality of speaker 24 by implementing the digital parametric equalizer 23 of the present invention. Audio system 22 does so using Equalizer Activator 30, Equalizer Interface 32, AudioCard Interface 34 and AudioCard 28. AudioCard 28 may be realized using any commercially available personal computer audio card, including for example, the OTI-608 AC'97 Audio Codec produced by Oak Technology of Sunnyvale, California.

Replace the paragraph at page 8 line 19 with the following text:

B2

Equalizer Interface 32 begins by presenting an equalizer user interface to a computer user during step 70. The equalizer user interface allows the computer user to manually modify the equalizer parameters for each band. Figure 8 illustrates one possible implementation of the equalizer user interface, graphical user interface 82, which resembles a conventional analog equalizer. Other implementations of the equalizer user interface are compatible with the present invention and need not be described in detail herein. Upon its initial presentation, equalizer user interface indicates the default equalizer parameter values selected by Equalizer Activator 30. After presenting the equalizer user interface, during step 72 Equalizer Interface 32 monitors the equalizer user interface for any indication that the user is manually modifying an equalizer parameter. For example, moving a slider bar 84 or selecting an input window 86 both indicate a possible alteration of a band's parameter values. In response, Equalizer Interface 32 examines slider bar positions and input windows to determine each band's equalizer parameter values.

Replace the paragraph at page 9 line 29 with the following text:

B3

During step 94 Insure Sound Quality 74 estimates whether the total combined cut/boost of the non-adjacent bands, Band1 50 and Band3 54, is acceptable using Relationship 8.

Replace the paragraph at page 10 line 6 with the following text:

B4

As with the relationship for adjacent bands, the precise value, Y, that the combined cut/boost of non-adjacent bands should be less than will vary depending upon the personal computer audio card used. A total combined cut/boost for non-adjacent bands of 0.75, or less, is preferred when using a sixteen bit Audio Codec, such as the OTI 608, to realize AudioCard 28. As discussed previously with respect to X, higher values of Y are possible when realizing AudioCard 28 with a twenty-four bit or more Audio Codec.

Replace the paragraph at page 11 line 8 with the following text:

B5

Referring once more to Figure 5, Filter 29 of digital parametric equalizer 23 may be realized using the improved four-multiply normalized ladder filter of the present invention. The improved normalized four-multiply ladder filter produces symmetrical cut and boost spectrums. As a result, the performance of equalizer 23 more closely approximates that of ideal equalizers, enabling frequencies to be cut as deeply as they are boosted. This improved filter is similar, but not identical, to the prior four-multiply normalized ladder filter discussed above. Specifically, filter 29 uses the signal flow diagram of Figure 1, the transfer function of Relationship 1, the first tuning coefficient of Relationship 3, the first filter coefficient of Relationship 5 and the second filter coefficient of Relationship 6. Despite these similarities between filter 29

and the prior art filter, each equalizer band 50, 52 and 54 produces an output signal with symmetrical cut and boost spectrums. This performance gain arises from the present invention's understanding and use of the second tuning coefficient, k_2. Analysis revealed that the second tuning coefficient, k_2, caused the asymmetry between cut and boost spectrums produced by prior art devices. Further analysis revealed that a filter's cut and boost spectrums could be made symmetrical using one Relationship for k_2 while boosting and using another Relationship for k_2 while cutting. These conditions are described by Relationships 9 and 10.

B5

Replace the paragraph at page 12 line 16 with the following text:

During step 120, for the selected band, Instructions 105 first examine the value of the cut/boost parameter to determine whether that band is to cut or boost its input signal. If the value of the cut/boost parameter is equal to one or greater, the band will be boosting, then Instructions 105 use a Boost Relationship to calculate the second tuning coefficient, k_2. The Boost Relationship used during step 122 is Relationship 9, set forth above. On the other hand, if the value of the band's cut/boost parameter is less than one, then during step 124 Instructions 105 use a Cut Relationship to calculate the value of the second tuning coefficient, k_2. The Cut Relationship used during step 124 is Relationship 10, also set forth above.

B6
